



An investigation of Taiwan University students' perceptions of online academic help seeking, and their web-based learning self-efficacy

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ABSTRACT

This study was conducted to investigate Taiwan University students' perceptions (including experience, confidence and preference) of online academic help seeking (OAHS) and students' level of web-based learning self-efficacy (WLSE). Two instruments, OAHS questionnaire, consisting of *information searching, formal and informal query* scales, and WLSE questionnaire, including *general and functional* scales, were then validated through collecting the responses from 300 university students. Results indicate reciprocal relations between experience, confidence and preference in students' online academic help seeking behaviors. Students' academic help seeking behaviors were related to their general self-efficacy in a web-based course setting. Students' functional WLSE was related to their perceptions of information searching for OAHS. Findings of this study also imply that students' experience of seeking help from informal online channels is prominent when they participate in a web-based course.

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1. Introduction

In the early studies of socialization and personality development, help seeking was often viewed as an indicator of dependent, immature, passive and even incompetent behavior (Nelson-Le Gall, 1985). However, during the past two decades researchers have indicated that help seeking is positive and beneficial for students (Aleven, Stahl, Schworm, Fisher, & Wallace, 2003; Karabenick, 1998; Lee, 2007; Newman, 2000). With regard to academic help seeking in traditional learning contexts, previous studies have discussed the relationships between help seeking and motivation, achievement goals, classroom norms, and helper characteristics (Butler, 1998; Cheong, Pajares, & Oberman, 2004; Karabenick, 2004; Ryan & Pintrich, 1997). Researchers have proposed that students who are in need of help do not always seek it, and the reason for resisting help seeking is due to the fact that they feel embarrassed, perceive a threat to their self-esteem or fear being considered as "dumb" by others (Karabenick, 1998, 2003; Kozanitis, Desbiens, & Chouinard, 2007; Ryan & Pintrich, 1997).

In distance learning environments, however, Kitsantas and Chow (2007) in comparing campus-based students with online students, indicated that college students enrolled in online courses present a

higher interest in seeking help from formal sources (i.e., instructors and teacher assistants). Kumrow (2007) found that nursing students in a blended learning setting (combining web-based and traditional instruction) were involved in more help seeking and had higher grades than those in the traditional lecture setting. Since Web environments provide less threatening interactions than face-to-face contexts, students have more privacy and opportunities to reflect on and refine comments, ask questions, and search for answers via electronic sources (Kitsantas & Chow, 2007; Kumrow, 2007).

Help seeking has different behavior patterns. Karabenick and Knapp (1991) proposed the following five categories: (a) formal help seeking (e.g., seeking help from school-provided instructional support, instructors or teacher assistants), (b) informal help seeking (e.g., seeking help from peers or knowledgeable friends), (c) instrumental activities (e.g., trying harder, studying more or taking better notes to perform better), (d) lowering performance aspirations (e.g., taking a lighter study load or easier courses), and (e) altering goals (e.g., changing to another school or major). Concerning new technologies integrated into learning contexts, different explanations for the nature of help seeking emerge. Puustinen and Rouet (2009) analyzed help seeking from two aspects: the type (i.e., human or non-human) and the location (e.g., physically present or on the Internet). They proposed three types of help seeking situations: (a) the helper is a human (e.g., a teacher), (b) the helper is a human expert communicating with the learner via technology (e.g., video conferencing, email or a mobile phone), and (c) the human helper is replaced by a help system. Puustinen and Rouet (2009) further suggested that information searching is one particular type of help seeking.

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Currently, computers and the Internet are considered as being rich information tools and resources for assisting learning activity. For instance, Mäkitalo-Siegl, Kohnle and Fischer (2011) examine the effect of integrating Information and Communication Technology (ICT) into inquiry learning task on students' help seeking processes. In Mäkitalo-Siegl and Fischer's (2011) study, they assert that learners could acquire different help resources by the support of technology in informal learning situations. However, they also indicate that research with regard to help seeking behavior outside of the classroom has hardly been discussed. Therefore, the present study focuses on university students' help seeking through the Internet when they encounter academic problems (e.g., homework problem) in formal or informal learning situations (e.g., at school or home). Based on the statements about information searching proposed by Puustinen and Rouet (2009), and the five help seeking behavior patterns addressed by Karabenick and Knapp (1991), this study considers that online academic help seeking (OAHS) consists of not only *information searching* but also *formal and informal queries*. OAHS in this study is considered as the spontaneous behavior of requesting assistance from others through the Internet; therefore, the other three help seeking behavior patterns proposed by Karabenick and Knapp (1991), instrumental activities, lowering performance aspirations and altering goals, are not included in this study. Moreover, the Internet is an open environment through which students could search for information or ask human experts about academic problems, unlike help functions, which are limited in certain learning systems. Consequently, the third help seeking situation addressed by Puustinen and Rouet (2009), a human helper replaced by a help system, is also not included in this survey.

In addition, previous studies indicate that students who spend more time using the Internet may increase their preferences for web-based learning environments (Chu & Tsai, 2009; Chuang & Tsai, 2005). Students with more Internet experience tend to display more positive Internet attitudes and confidence in its usage (Chu & Tsai, 2009; Peng, Tsai, & Wu, 2006; Wu & Tsai, 2006). That is, experience of using Internet may positively relate to preference and confident of using it. Furthermore, Liang and Tsai (2008) found that students' preferences for constructivist web-based learning environments might be facilitated by their confidence in using the Internet. For example, students with higher confidence in using the Internet express more preference to explore multiple sources of information, engage in an inquiry activity or probe the nature of knowledge in web-based learning environments. Also, Chu and Tsai (2009) concluded that confidence in using the Internet is a mediating variable in the correlation between Internet experience and the learners' preference for web-based learning environments. The result shows that learners spending more time on the Internet practice may possess strong confidence in the utilization of Internet, who may prefer to learn in a web-based learning environment. Accordingly, the current study proposes that there are reciprocal correlations among the *experience*, *confidence* and *preference* of students' online learning behaviors, including academic help seeking. By investigating students' OAHS experience, confidence and preferences, their relevant ideas toward OAHS may be fully interpreted to assist instructional design.

Help seeking behavior can also be conceptualized as one kind of self-regulated learning strategy (Karabenick & Newman, 2006; Kitsantas, 2002; Zusho, Karabenick, Bonney, & Sims, 2007). There is some evidence that students' self-regulated learning strategies are related to their learning self-efficacy (Pintrich & Schunk, 2002; Wang & Lin, 2007). That is, students with higher learning self-efficacy would tend to use more sophisticated self-regulated learning strategies (e.g., planning, monitoring, or help seeking). "Self-efficacy" refers to one's beliefs and expectations regarding one's ability to perform a task required to achieve specific outcomes (Bandura, 1997). Researchers have also found that students who tend to seek help more frequently would have higher academic self-efficacy than those who rarely seek help (Karabenick & Knapp, 1991; Ryan & Pintrich, 1997).

Studies related to web-based learning have also concluded that students who utilize more sophisticated strategies and exhibit better performance in online information searching tasks usually have higher "Internet self-efficacy" (Joo, Bong, & Choi, 2000; Tsai & Tsai, 2003). For example, in Tsai and Tsai's study (2003), while students with high Internet self-efficacy often use a variety of keywords to search relevant information, those with low Internet self-efficacy were reluctant to try another approaches when the keywords did not work. "Internet self-efficacy" indicates an individual's self-evaluated expectations and confidence in their skills of using the Internet and accomplishing Internet-related tasks (Chu, 2010; Kao & Tsai, 2009; Liang & Tsai, 2008). Based on the aforementioned discussion, this study hypothesizes that there are some correlations between users' online help seeking behavior and their self-efficacy in online, web-based learning contexts. Regarding students' self-efficacy in terms of web-based learning, this study proposes that web-based learning self-efficacy (WLSE) could include two major components. The first one, named *general WLSE*, refers to a student's beliefs and confidence in his/her competence to complete online courses academically; the other, labeled *functional WLSE*, is the confidence in utilizing relevant Internet or computer skills to enroll in and complete web-based courses, similar to the idea of Internet self-efficacy defined previously, but confining the self-efficacy to participating in web-based instruction. Therefore, WLSE, that includes general and functional self-efficacy, is explored, and then its relationship with university students' perceptions of OAHS is examined.

In sum, the research purposes of this study are as follows:

1. To develop instruments for assessing university students' OAHS perceptions and WLSE.
2. To explore the relationships between students' experience, confidence and preference for OAHS, and to examine the possible differences among these.
3. To explore the relationships between students' WLSE and perceptions of OAHS.

2. Method

2.1. Sample

The respondents of this study included 300 university students with adequate Internet experience (including 138 males and 162 females) in Taiwan, as all of them were capable of exploring and searching information through the Internet. They were either undergraduate or graduate students, of which 39 were freshmen, 52 were sophomores, 45 were juniors, 63 were seniors and 101 were graduates. All participants were asked to respond to online academic help seeking (OAHS) questionnaire items; at the same time, students who had experience of taking web-based courses were further asked to respond to a web-based learning self-efficacy (WLSE) questionnaire. Among these respondents, there were 124 students who had taken web-based courses at least once.

2.2. Instruments

In this study, the *online academic help seeking* (OAHS) questionnaire has been developed according to the aforementioned three major behaviors (information searching, formal and informal queries). These three behaviors constitute the three scales of the OAHS questionnaire. Moreover, each OAHS questionnaire item was designed to assess university students' perceptions of three dimensions, namely experience, confidence and preference, similar to those adopted by Lee and Tsai (2011). They were asked to rate the frequency of OAHS (ranging from "always" to "never") in the experience dimension, their OAHS confidence level (ranging from "strongly confident" to "strongly unconfident") in the confidence

dimension, and their OAHs favor degree (ranging from “like very much” to “dislike very much”) in the preference dimension, all of which used five-point Likert scales. For each item of OAHs questionnaire, the respondents had to mark their responses to the three dimensions at once (see Fig. 1). The design of questionnaire format was referred to Lee and Tsai (2011, p. 908). A recent study regarding social science studies indicated that data measured by five or seven or ten-point Likert scales generated approximately duplicate results with regard to means and variations of data, and data characteristics (Dawes, 2008). Therefore, this study considered that a five-point Likert scaling method used widely in social science survey research would be best to use to obtain valid data.

After the initial construction of the OAHs questionnaire, two experts in the web-based learning field commented on it for its face validity. The items of the OAHs questionnaire are presented in Appendix A. Following are the details of the three scales of the OAHs questionnaire:

1. Information searching: measuring students' perceptions of seeking relevant solutions through search engines (e.g., Google, Yahoo) or expertise websites (e.g., Wikipedia) when encountering academic problems.
2. Formal query: measuring students' perceptions of seeking help from instructors or class assistants through any online channel.
3. Informal query: measuring students' perceptions of seeking help from knowledgeable peers through the Internet or posting messages on relevant websites for querying unknown experts' help.

The *web-based learning self-efficacy* (WLSE) questionnaire was designed by integrating the concept of academic learning self-efficacy and Internet self-efficacy. Therefore, the WLSE questionnaire consisted of two scales in this study. The general WLSE is based on the motivated strategies for learning questionnaire (MSLQ) proposed by Pintrich, Smith, Garcia, and McKeachie (1991) and the college academic self-efficacy scale (CASES) designed by Owen and Froman (1988). The scale of the general WLSE refers to students' expectations of and confidence in web-based learning in general. A similar version was adopted by Tsai (2009). The other scale, the functional WLSE, is modified from the Internet self-efficacy survey (ISS) developed by Tsai and Tsai (2003). The scale of the functional WLSE indicates students' confidence in using Internet skills to take online courses. The WLSE questionnaire is presented using a five-point Likert scale.

Appendix B shows the items of the WLSE questionnaire. Descriptions of the two scales are as follows:

1. General WLSE: assessing students' self-efficacy about general web-based learning. Thus, the higher the scores, the more confidence in self-perceived ability to complete online courses academically.
2. Functional WLSE: assessing students' self-efficacy in terms of utilizing the Internet or computer skills to enroll in web-based courses. That is, the higher the scores, the more confidence in self-perceived capability of having adequate skills to enroll in online courses.

It should be noted that only those students with experience of web-based courses (n = 124) responded to the WLSE questionnaire, as without relevant experience, the students may not be able to reflect their self-efficacy toward web-based learning. Even though the WLSE questionnaire was designed for measuring the respondents' overall online learning self-efficacy, this study assumed that the students would respond to the WLSE questionnaire according to their experience of certain specific online courses in which they had taken before.

3. Results

3.1. Factor analysis—OAHs

This study utilized the exploratory factor analysis (EFA), principal component analysis with oblique rotation, to clarify the structure of the online academic help seeking and the web-based learning self-efficacy. The factor analysis showed that the subjects' responses on the OAHs questionnaire were grouped into three factors: 'Information searching', 'Formal query', and 'Informal query.' In all three dimensions (i.e. experience, confidence, preference) of the OAHs investigation, these scales consisted of the same questionnaire items. There were two items in the information searching scale and four items in the formal and informal query respectively. These items were filtered by a series of factor analyses. In order to make fair comparisons, the items should be valid across the measurement of the students' experience, confidence and preference of OAHs. Although we surveyed the students' perceptions for three dimensions of OAHs by five items respectively, in the information searching scale, only two items remained for final analysis based on the aforementioned procedure.

	Experience	Confidence	Preference
	low-----high	low-----high	low-----high
1. When I have an academic problem, I will seek a relevant solution using search engines (e.g., Google, Yahoo).	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
2. When I have an academic problem, I will seek a relevant solution using Wikipedia.	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
3. When I have an academic problem, I will email the instructor or class assistants to make a query.	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
4. When I have an academic problem, I will query the instructor or class assistants on the web-based course forum or guestbook for a relevant solution.	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
5. When I have an academic problem, I will query the instructor or class assistants by Instant Message Software (e.g., MSN, Skype).	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5

Fig. 1. A snapshot of the OAHs questionnaire.

Table 1
Rotated factor loadings and Cronbach's α values for the OAHS experience, confidence and preference scales ($n = 300$).

Item	Experience ^a			Confidence ^b			Preference ^c		
	Factor 1	Factor 2	Factor 3	Factor 1	Factor 2	Factor 3	Factor 1	Factor 2	Factor 3
Factor 1: information searching									
Information searching 1	.841			.862			.873		
Information searching 2	.727			.824			.788		
Factor 2: formal query									
Formal query 1		.873			.928			.890	
Formal query 2		.630			.732			.722	
Formal query 3		.617			.642			.754	
Formal query 4		.863			.818			.810	
Factor 3: informal query									
Informal query 1			.707			.893			.823
Informal query 2			.491			.732			.646
Informal query 3			.804			.774			.752
Informal query 4			.796			.711			.830
Reliability coefficient (α)	0.55	0.76	0.69	0.65	0.81	0.80	0.62	0.81	0.77
Eigenvalue	1.38	3.33	1.45	1.27	1.57	3.86	1.40	3.41	1.79

^a Overall $\alpha = 0.76$, total variance explained = 61.53%.

^b Overall $\alpha = 0.81$, total variance explained = 66.94%.

^c Overall $\alpha = 0.77$, total variance explained = 65.96%.

It is revealed in Table 1 that the factors in the experience dimension of the OAHS questionnaire accounted for 61.53% of the variance totally. The eigenvalues of the three factors were larger than one. The overall reliability alphas were 0.76 and 0.55, 0.76, and 0.69 for each scale respectively. For social science research, a Cronbach alpha coefficient even as low as 0.55 can be recognized and accepted for statistical consideration (Hatcher & Stepanski, 1994). Therefore, these scales were deemed to be sufficiently reliable to assess students' experience of OAHS.

The factor loadings for each item of the three factors of OAHS confidence are also shown in Table 1. These factors explained 66.94% of variance totally. The reliability (alpha) coefficients for these scales respectively were 0.65, 0.81, and 0.80, and the overall alpha was 0.81. Moreover, Table 1 presents the factor analysis of the preference for OAHS. The three factors accounted for 65.96% of the variance. The overall reliability alpha was 0.77 and 0.62, 0.81, and 0.77 for each scale respectively.

3.2. Factor analysis—WLSE

With regard to the factor analysis results of the WLSE questionnaire, Table 2 reveals that 10 items are extracted under two factors: 'general self-efficacy' and 'functional self-efficacy' with eigenvalues of 4.55 and 1.56. The total explained variance was 61.10% which was good enough for explanation. The overall reliability alpha was 0.86, 0.84 and 0.81, respectively, for each scale, making it acceptable in terms of internal consistency.

Table 2
Rotated factor loadings and Cronbach's α values for the WLSE scales ($n = 124$).

Item	Factor 1	Factor 2
Factor 1: general self-efficacy (mean = 3.30, SD = 0.65)		
General self-efficacy 1	.694	
General self-efficacy 2	.815	
General self-efficacy 3	.872	
General self-efficacy 4	.704	
General self-efficacy 5	.833	
Factor 2: functional self-efficacy (mean = 3.76, SD = 0.60)		
Functional self-efficacy 1		.500
Functional self-efficacy 2		.797
Functional self-efficacy 3		.950
Functional self-efficacy 4		.586
Functional self-efficacy 5		.742
Reliability coefficient (α)	0.84	0.81
Eigenvalue	4.55	1.56

Overall $\alpha = 0.86$, total variance explained = 61.10%.

3.3. Correlation between experience, confidence, and preference for the OAHS factors

Table 3 presents the relationships among the university students' experience, confidence and preference among the OAHS scales. It reveals that there are significantly high correlations among the students' experience, confidence and preference for each OAHS factor. For example, in the information searching scale, the correlation coefficient for the relationships between students' experience and confidence, experience and preference, and confidence and preference were 0.57 ($p < 0.01$), 0.56 ($p < 0.01$), and 0.68 ($p < 0.01$), respectively. Similar high correlation coefficients were also observed among experience, confidence and preference within the same scale, such as formal query. That is, university students' experience, confidence and preference for OAHS had reciprocal correlations among each other for each scale.

Furthermore, Table 3 shows that there are significantly moderate correlations between the students' formal and informal queries for OAHS in the dimensions of experience ($r = 0.41$, $p < 0.01$), confidence ($r = 0.46$, $p < 0.01$) and preference ($r = 0.30$, $p < 0.01$). These results indicate that students with more experience, confidence or preference for seeking help from teachers or class assistants were inclined to have more experience, confidence or preference for seeking help from knowledgeable peers through the Internet or posting messages on relevant websites for querying unknown experts' help. However, according to Table 3, it was found that there were relatively low or no correlations between information searching and formal or informal queries for OAHS. This seems to suggest that information searching does not play an important role in OAHS query behavior. The information searching behavior may be independent from the formal and informal online query behaviors.

3.4. Comparisons of experience, confidence, and preference for the OAHS factors

To further understand the university students' OAHS perceptions, it is interesting to compare their experience, confidence, and preference on the OAHS scales. Through a series of ANOVA and post-hoc tests, Table 4 shows that the university students' confidence was higher than their experience of information searching for OAHS. It also revealed that the students' confidence was stronger than their preferences and experiences of formal and informal queries for OAHS. That is, the university students showed a certain degree of high confidence in seeking academic help online, but actually they may have less experience of and preference for asking questions formally

Table 3
Correlation between students' experience, confidence, and preference for the three OAHS factors.

	Experience			Confidence			Preference		
	Searching	Formal query	Informal query	Searching	Formal query	Informal query	Searching	Formal query	Informal query
ES	1								
EFQ	.17**	1							
EIQ	.20**	.41**	1						
CS	.57**	.06	.10	1					
CFQ	.00	.45**	.12*	.13*	1				
CIQ	.08	.19**	.58**	.26**	.46**	1			
PS	.56**	.09	.08	.68**	.05	.18**	1		
PFQ	.10	.54**	.12*	.12*	.64**	.21**	.18**	1	
PIQ	.09	.25**	.65**	.19**	.30**	.74**	.16**	.30**	1

n = 300

ES: experience of information searching, EFQ: experience of formal query, EIQ: experience of informal query, CS: confidence of information searching, CFQ: confidence of formal query, CIQ: confidence of informal query, PS: preference of information searching, PFQ: preference of formal query, PIQ: preference of informal query.

** $p < .01$.

* $p < .05$.

or informally. In addition, according to Table 4, the university students scored much higher on the searching scale than on the formal and informal query scales for all three dimensions of experience, confidence and preference. Compared with their formal and informal query behavior, they were more inclined to search for information online when encountering academic problems.

3.5. Correlation between the factors of OAHS and WLSE

To examine the hypothesis that there are relations between students' help seeking behaviors and their self-efficacy in online learning contexts, the correlations between the university students' OAHS and WLSE were further explored in this study, with the results presented in Table 5. It was found that their general WLSE had relatively high correlation with their confidence in information searching ($r = 0.37, p < 0.01$). There were significant positive correlations between the students' general WLSE and their informal queries for OAHS in the three dimensions. Moreover, the students' experience of and preference for formal queries in OAHS had a relationship with their general WLSE. In sum, all three types of students' online help seeking behaviors were related to their general WLSE. Furthermore, Table 5 indicates that the students' experience ($r = 0.26, p < 0.01$), confidence ($r = 0.55, p < 0.01$), and preference ($r = 0.36, p < 0.01$) for information searching for OAHS had significant relationships with their functional WLSE. That is, university students who had stronger experience, confidence, and preferences for information searching for OAHS, especially confidence in information searching, would tend to have higher self-efficacy for functional WLSE.

3.6. Stepwise regression analysis of predicting students' WLSE using OAHS

Through stepwise multiple regression analyses, this study attempted to predict the students' WLSE by using OAHS responses as predictors. That is, for the regression analyses, the dependent variables were the WLSE scales (general and functional WLSE), and the OAHS scales (information searching, formal and informal query)

in the three dimensions (experience, confidence and preference) were processed as the predicting variables. In Table 6, the stepwise regression model showed that the students' confidence in information searching ($t = 4.15, p < 0.001$) and experience of informal query ($t = 2.26, p < 0.05$) were the significant predictors for their general WLSE. Also, the students' confidence in information searching ($t = 7.20, p < 0.001$) was the sole significant predictor explaining their functional WLSE. As students' confidence is theoretically more related to the construct of their self-efficacy, confidence in searching behavior was an essential predicting variable of general and functional WLSE in the stepwise regression model. This finding also suggested the important contribution of searching behavior in web-based learning. Besides, the students' experience of informal query for OAHS was the second variable to predict their general WLSE. The result indicated that informal query played a significant role in a web-based learning environment.

4. Discussion

This study developed an online academic help seeking (OAHS) questionnaire to assess university students' perceptions (including experience, confidence and preference) of OAHS, and a web-based learning self-efficacy (WLSE) questionnaire to assess students' self-efficacy in a web-based learning environment. Through exploratory factor analysis, it was found that the two instruments were sufficiently reliable for investigating university students' perceptions of OAHS and their WLSE.

The relationships between students' experience, confidence and preference for OAHS were explored by correlation analysis in the present study. The results showed that those students with more experience tended to possess stronger confidence and preference for information searching, and for formal and informal queries for OAHS, respectively. Therefore, reciprocal relations were found between experience, confidence and preference in students' online academic help seeking behaviors. The results of the correlations between formal and informal queries for OAHS revealed that students who had more experience (or confidence, or preference) of seeking help from

Table 4
Comparisons of students' experience, confidence, and preference for the three OAHS factors.

	(1) Experience (mean, SD)	(2) Confidence (mean, SD)	(3) Preference (mean, SD)	F-value	Post-hoc test
Searching	3.52 (0.76)	3.62 (0.70)	3.60 (0.72)	3.54*	2 > 1
Formal query	2.24 (0.77)	3.05 (0.78)	2.81 (0.72)	196.89***	2 > 3 > 1
Informal query	2.28 (0.74)	2.78 (0.79)	2.69 (0.73)	103.90***	2 > 3 > 1

n = 300.

*** $p < .001$.

* $p < .05$.

Table 5
Correlation between the OAHS and WLSE factors (n = 124).

	Experience			Confidence			Preference		
	Searching	Formal query	Informal query	Searching	Formal query	Informal query	Searching	Formal query	Informal query
General WLSE	.16	.23**	.23**	.37**	.17	.20*	.18	.18*	.20*
Functional WLSE	.26**	.15	.01	.55**	.20*	.13	.36**	.14	.10

** $p < .01$.* $p < .05$.

instructors would tend to have more experience (or confidence, or preference) of querying peers or unknown experts online. There were relatively low or no correlations between information searching and formal or informal queries for OAHS. Hence, information searching did not play an important role in query behaviors for OAHS, suggesting that querying and searching action were probably different patterns of online help seeking behaviors.

Furthermore, ANOVA tests were implemented to examine the possible differences among the university students' experience, confidence and preference for the OAHS scales. It was found that the university students' confidence was higher than their experience of and preference for OAHS generally, and they scored much higher on the information searching scale than on the formal and informal query scales in all three dimensions. Obviously, the university students present a certain degree of high confidence in seeking help in a web-based environment, but actually they may have less experience and preference for inquiry using formal or informal methods. Therefore, it is important to increase students' experience of or preference for seeking help to enhance their learning strategies. Meanwhile, the students tended to search for information online when they encountered academic problems. These results may suggest that teachers or school administrators should provide online academic help channels freely and try to enhance students' motivation to make queries when they experience academic difficulties, no matter whether they use formal or informal methods.

Moreover, the results of the correlations between the OAHS and the WLSE factors indicate that all of the students' academic help seeking behavior had relationships with their general self-efficacy in a web-based course setting. Due to the fact that help seeking was conceptualized as one kind of self-regulated learning strategy (Karabenick & Newman, 2006; Kitsantas, 2002; Zusho et al., 2007), the results of this study show research evidence that students' self-regulated learning strategies had interplay with their learning self-efficacy, as shown by earlier research work (e.g., Pintrich & Schunk, 2002; Wang & Lin, 2007). In this study, students' functional WLSE was related to their perceptions of information searching for OAHS. As aforementioned, the functional WLSE factor is similar to Internet self-efficacy in a web-based learning context. The results of this study substantiate the positive relationships between Internet self-efficacy and information searching strategies found by previous studies (Joo et al., 2000; Tsai & Tsai, 2003).

Through stepwise regression analysis, it was found that the students' confidence in information searching and experience of

informal query could predict their general WLSE. In addition, the students' functional WLSE was only predicted by their confidence in information searching. Since information searching is an important component of online learning environments (Tsai & Tsai, 2003; Tu, Shih, & Tsai, 2008; Van de Vord, 2010), and confidence is highly linked with the construct of self-efficacy, the students' confidence in information searching can well predict their general and functional self-efficacy in terms of online learning. Furthermore, experience of informal queries for OAHS is the other variable to predict students' general WLSE. The result of stepwise regression may reveal that the students' experience of seeking help from informal online channels (e.g., knowledgeable peers, unknown experts from the Internet) is prominent when they participate in a web-based course. Students with more experience of OAHS informal querying would tend to show more general self-efficacy during the web-based learning process. Kitsantas and Chow's study (2007) addressed that university students would prefer to seek help from formal sources when enrolling in web-based courses, while this study proposes that instructors or web-based learning administrators should pay more attention to students' OAHS informal queries.

As a whole, the university students were familiar with the strategies of searching information online, while they reflected less experience or confidence or preference of formal and informal query behaviors for OAHS. According to the aforementioned discussions, we suggested that formal and informal query for OAHS should be concerned more by teachers or school administrators, especially informal query which was a variable to predict university students' general WLSE. Meantime, we also found that there was a positive interplay between learners' perception of formal and informal query. Through the enhancement of formal query, it may be helpful for learners to foster the motivation and behaviors of querying informally. For instance, the instructors of web-based course could encourage learners to raise questions through email or message delivering function provided in the web-based learning system as they may encounter academic problems; or the mechanism of personal guidance after class from teachers or assistants could be established online; or designing an e-tutor system which could provide a real-time communication platform for learners to seek help from teachers or assistances without face-to-face embarrassment and threat of self-esteem (Karabenick, 1998, 2003; Kozanitis et al., 2007; Ryan & Pintrich, 1997). The social network communication recently emerged may also be considered to be integrated into the OAHS. An instructor of online course could create his/her social network website (e.g., Facebook, Twitter, Plurk) for an individual or specific course to build a special learning community. As the contact with the web-based course instructor increases in students' daily lives, the interaction between learners and teachers could be enhanced. Also, with teachers' encouragement and guidance of OAHS, the learners would realize the benefits of querying others through online channels. By the means of enhancing formal query for OAHS, this study proposes that learners would be used to seek help as they have academic problems no matter from teachers or peers or even unknown experts online. By enhancement of informal query behavior, this study anticipated that learners' self-efficacy toward web-based learning would be improved.

Table 6
Stepwise regression model for predicting students' OAHS based on their WLSE (n = 124).

Dependent variables	Predicting variables	B	S.E.	β	T	R
General WLSE	CS	0.32	0.08	0.35	4.15***	0.42
	EIQ	0.17	0.08	0.19	2.26*	
	Constant	1.73	0.32		5.42***	
Functional WLSE	CS	0.46	0.06	0.55	7.20***	0.55
	Constant	2.10	0.24		8.67***	

CS: confidence of information searching, EIQ: experience of informal query.

*** $p < .001$.* $p < .05$.

5. Conclusion and future research suggestion

In conclusion, this study utilized questionnaires to investigate students' self-reported perceptions about OAHS and WLSE. The results could probably depict a general situation of contemporary university students' perceptions of OAHS and their WLSE. The authors suggest that open-ended questionnaires or interviews might be used to acquire more insights into students' OAHS behaviors in further studies. To explore students' self-efficacy in a web-based learning environment, the topics which may be related to WLSE such as the effects of different online course settings, knowledge domains, or other learners' characteristics (e.g., learning styles) should be surveyed further. Besides, this study also proposes that the instruments for assessing WLSE toward more specific courses should be developed in the future. By measuring the learners' self-efficacy in general in the beginning of a certain online course and their web-based learning self-efficacy near the end of the course, the instructor could find out the possible change for the learners' WLSE. Studies concerning the gap between WLSE toward web-based learning in general and WLSE toward a specific course may provide potential insights for the improvement of implementing online courses. Finally, there was a clear limitation in this study. In the information searching scale, only two items remained for the reason that it should be valid across the measurement of the students' experience, confidence and preference of OAHS. Future study could consider adding more items into the information searching scale and performing factor analysis further to construct more valid OAHS questionnaire with additional items.

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Appendix A. The OAHS questionnaire items

A.1. Information searching

1. When I have an academic problem, I will seek a relevant solution using search engines (e.g., Google, Yahoo).
2. When I have an academic problem, I will seek a relevant solution using Wikipedia.

A.2. Formal query

1. When I have an academic problem, I will email the instructor or class assistants to make a query.
2. When I have an academic problem, I will query the instructor or class assistants on the web-based course forum or guestbook for a relevant solution.
3. When I have an academic problem, I will query the instructor or class assistants by Instant Message Software (e.g., MSN, Skype).
4. When I have an academic problem, I will query the instructor or class assistants through possible online channels.

A.3. Informal query

1. When I have an academic problem, I will post a message on relevant web forums requesting unknown experts' help.
2. When I have an academic problem, I will ask for peers' help through some popular blog systems (e.g., Plurk, Twitter).
3. When I have an academic problem, I will post a query on relevant knowledge community websites (e.g., Yahoo! Knowledge).
4. When I have an academic problem, I will find the proper websites, forums or Bulletin Board System (BBS) to ask for unknown experts' help.

Appendix B. The WLSE questionnaire items

B.1. General WLSE

1. I believe that I can get excellent grades on web-based courses.
2. I believe that I can capture the basic concepts taught in web-based courses.
3. I believe that I can understand the most difficult part of web-based learning materials.
4. I believe that I can do a good job of learning tasks involved in web-based courses.
5. I believe that I can master the learning materials in web-based courses.

B.2. Functional WLSE

1. I believe that I can find the functions I need in an online learning system.
2. I believe that I can upload assignments to an online learning system before the deadline.
3. I believe that I can download instructional materials from an online learning system.
4. I believe that I can navigate instructional materials in an online learning system at will.
5. I believe that I can email instructors to make queries from an online learning system.

References

- Aleven, V., Stahl, E., Schworm, S., Fisher, F., & Wallace, R. (2003). Help seeking and help design in interactive learning environments. *Review of Educational Research*, 73(3), 277–320.
- Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York: Freeman.
- Butler, R. (1998). Determinants of help seeking: Relations between perceived reasons for classroom help-avoidance and help-seeking behaviors in an experimental context. *Journal of Educational Psychology*, 90(4), 630–643.
- Cheong, Y. F., Pajares, F., & Oberman, P. S. (2004). Motivation and academic help-seeking in high school computer science. *Computer Science Education*, 14(1), 3–19.
- Chu, R. J. (2010). How family support and Internet self-efficacy influence the effects of e-learning among higher aged adults—Analyses of gender and age differences. *Computers & Education*, 55(1), 255–264.
- Chu, R. J., & Tsai, C. C. (2009). Self-directed learning readiness, Internet self-efficacy, and preferences for constructivist Internet-based learning environments among higher aged adults. *Journal of Computer Assisted Learning*, 25(5), 489–501.
- Chuang, S. C., & Tsai, C. C. (2005). Preferences toward the constructivist Internet-based learning environments among high school students in Taiwan. *Computers in Human Behavior*, 21(2), 255–272.
- Dawes, J. (2008). Do data characteristics change according to the number of scale points used? An experiment using 5-point, 7-point and 10-point scales. *International Journal of Market Research*, 50(1), 61–77.
- Hatcher, L., & Stepanski, E. J. (1994). *A step-by-step approach to using the SAS system for univariate and multivariate statistics*. Cary, NC: SAS Institute.
- Joo, Y. J., Bong, M., & Choi, H. J. (2000). Self-efficacy for self-regulated learning, academic self-efficacy, and Internet self-efficacy in Web-based instruction. *Educational Technology Research & Development*, 48(2), 5–17.
- Kao, C. P., & Tsai, C. C. (2009). Teachers' attitudes toward web-based professional development, with relation to Internet self-efficacy and beliefs about web-based learning. *Computers & Education*, 53(1), 66–73.
- Karabenick, S. A. (1998). Help seeking as a strategic resource. In S. A. Karabenick (Ed.), *Strategic help seeking: Implications for learning and teaching*. Mahwah, NJ: Lawrence Erlbaum Associates.
- Karabenick, S. A. (2003). Seeking help in large college classes: A person-centered approach. *Contemporary Educational Psychology*, 28(1), 37–58.
- Karabenick, S. A. (2004). Perceived achievement goal structure and college student help seeking. *Journal of Educational Psychology*, 96(3), 569–581.
- Karabenick, S. A., & Knapp, J. R. (1991). Relationship of academic help-seeking to the use of learning strategies and other instrumental achievement behavior in college students. *Journal of Educational Psychology*, 83(2), 221–230.
- Karabenick, S. A., & Newman, R. S. (2006). *Help seeking in academic settings: Goals, groups and contexts*. Mahwah, NJ: Erlbaum.
- Kitsantas, A. (2002). Test preparation and test performance: A self-regulatory analysis. *Journal of Experimental Education*, 70(2), 101–113.
- Kitsantas, A., & Chow, A. (2007). College students' perceived threat and preference for seeking help in traditional, distributed, and distance learning environments. *Computer Science Education*, 48(3), 383–395.
- Kozanitis, A., Desbiens, J. F., & Chouinard, R. (2007). Perception of teacher support and reaction toward questioning: Its relation to instrumental help-seeking and

- motivation to learn. *International Journal of Teaching and Learning in Higher Education*, 19(3), 238–250.
- Kumrow, D. E. (2007). Evidence-based strategies of graduate students to achieve success in a hybrid Web-based course. *The Journal of Nursing Education*, 46(3), 140–145.
- Lee, C. J. (2007). Academic help seeking: Theory and strategies for nursing faculty. *The Journal of Nursing Education*, 46(10), 468–475.
- Lee, S. W. Y., & Tsai, C. C. (2011). Students' perceptions of collaboration, self-regulated learning, and information seeking in the context of Internet-based learning and traditional learning. *Computers in Human Behavior*, 27(2), 905–914.
- Liang, J. C., & Tsai, C. C. (2008). Internet self-efficacy and preferences toward constructivist Internet-based learning environments: A study of pre-school teachers in Taiwan. *Educational Technology and Society*, 11(1), 226–237.
- Mäkitalo-Siegl, K., & Fischer, F. (2011). Stretching the limits in help-seeking research: Theoretical, methodological, and technological advances. *Learning and Instruction*, 21(2), 243–246.
- Mäkitalo-Siegl, K., Kohnle, C., & Fischer, F. (2011). Computer-supported collaborative inquiry learning and classroom scripts: Effects on help-seeking processes and learning outcomes. *Learning and Instruction*, 21(2), 257–266.
- Nelson-Le Gall, S. (1985). Help-seeking behavior in learning. In E. W. Gordon (Ed.), *Review of Research in Education*, (Vol. 12, pp. 55–90). Washington, DC: American Educational Research Association.
- Newman, R. S. (2000). Social influences on the development of children's adaptive help seeking: The role of parents, teachers, and peers. *Developmental Review*, 20(3), 350–404.
- Owen, S. V., & Froman, R. D. (1988). *Development of a college academic self-efficacy scale*. (Report No. TM 012 263). East Lansing, MI: National Center for Research on Teacher Learning.
- Peng, H., Tsai, C. C., & Wu, Y. T. (2006). University students' self-efficacy and their attitudes toward the Internet: The role of students' perceptions of the Internet. *Education Studies*, 32(1), 73–86.
- Pintrich, P. R., & Schunk, D. H. (2002). *Motivation in education: Theory, research, and applications* (2nd ed.). New Jersey: Prentice Hall.
- Pintrich, P. R., Smith, D. A. F., Garcia, T., & McKeachie, W. J. (1991). *A manual for the use of the Motivated Strategies for Learning Questionnaire (MSLQ)*. Ann Arbor, MI: National Centre for Research to Improve Postsecondary Teaching.
- Puustinen, M., & Rouet, J. F. (2009). Learning with new technologies: Help seeking and information searching revisited. *Computers & Education*, 53(4), 1014–1019.
- Ryan, A. M., & Pintrich, P. R. (1997). "Should I ask for help?" The role of motivation and attitudes in adolescents' help-seeking in math class. *Journal of Educational Psychology*, 89(2), 329–341.
- Tsai, C.-C. (2009). Conceptions of learning versus conceptions of web-based learning: The differences revealed by college students. *Computers & Education*, 53(4), 1092–1103.
- Tsai, M. J., & Tsai, C. C. (2003). Information searching strategies in web-based science learning: The role of Internet self-efficacy. *Innovations in Education and Teaching International*, 40(1), 43–50.
- Tu, Y. W., Shih, M., & Tsai, C. C. (2008). Eighth graders' web searching strategies and outcomes: the role of task types, web experiences and epistemological beliefs. *Computers & Education*, 51(3), 1142–1153.
- Van de Vord, R. (2010). Distance students and online research: Promoting information literacy through media literacy. *Internet and Higher Education*, 13(3), 170–175.
- Wang, S. L., & Lin, S. J. (2007). The application of social cognitive theory to web-based learning through NetPorts. *British Journal of Educational Technology*, 38(4), 600–612.
- Wu, Y. T., & Tsai, C. C. (2006). University students' Internet attitudes and Internet self-efficacy: A study at three universities in Taiwan. *Cyberpsychology & Behavior*, 9(4), 441–450.
- Zusho, A., Karabenick, S. A., Bonney, C. R., & Sims, B. C. (2007). Contextual determinants of motivation and help seeking in the college classroom. In R. P. Perry, & J. C. Smart (Eds.), *The scholarship of teaching and learning in higher education*. Dordrecht, Netherlands: Springer.